

## Management Guide for **Cooley Spruce Gall Aphid**

Adelgid *Adelges cooleyi* (Gill.)

Cooley spruce gall adelgid is native to North America and is widespread over the northern and central Rocky Mountains.

**Host:**  
 • Spruce  
 • Douglas-fir

### Topics

Damage	1
Life History	1
<a href="#">Life Cycle</a>	2-3
<a href="#">Management</a>	3
<a href="#">Other Reading</a>	4
<a href="#">Field Guide</a>	
<a href="#">Management Guide Index</a>	

### *Damage*

On Douglas-fir, nymphs suck the juice out of current needles causing needle discoloration, distortion and premature needle drop. Secondary damage may be caused by sooty mold that grows on honeydew excreted by the insect. Excessive numbers of these insects occur on cones, which may affect seed production. Yellow spots, distorted and bent needles result from feeding damage. Damaged needles may shed prematurely. Galls are not formed on Douglas-fir.

On spruce, nymphs form pinecone-shaped galls on tips of twigs and branches which usually kills the terminal growth. If only a partial gall forms on the terminal

growth, it allows a portion of the upper needles to survive and the terminal continues to develop. Cooley spruce gall adelgids are commonly found on blue spruce, however they do little to no damage to the tree. The damage caused by this insect affects only aesthetics and does not threaten tree survival.



Old brown gall formed on the end of blue spruce. Photo by Eric R. Day

### Key Points

- This species of adelgid requires two hosts to complete their life cycle; spruce and Douglas-fir.
- The galls it produces on spruce are formed by aphid-like insects.
- Excessive numbers of these insects occur on cones, which may affect seed production.

### *Life History*

The complex lifecycle normally requires two hosts (spruce and Douglas-fir) to complete (Figure 1).

**CYCLE ON SPRUCE:** Wooly aphids overwinter as immature females underneath young branches. In the spring, females mature and lay a few hundred eggs near developing buds. The eggs

hatch around bud break with the young nymphs migrating to new growth. The nymphs feed at the base of the expanding needles. Saliva introduced into the plant by feeding nymphs causes changes in plant development producing the pineapple shaped gall. The insects develop in chambers within the gall which gradually increases in size.

## Life History

As the insects feed, the galls remain green with pink or purple shading (Figure 2). By late July, early August the galls dry out and the chambers open releasing the winged forms of the insect. Older galls are brown in color and may persist for years on affected spruce (Figure 3). Most of the winged forms then migrate to Douglas-fir trees.

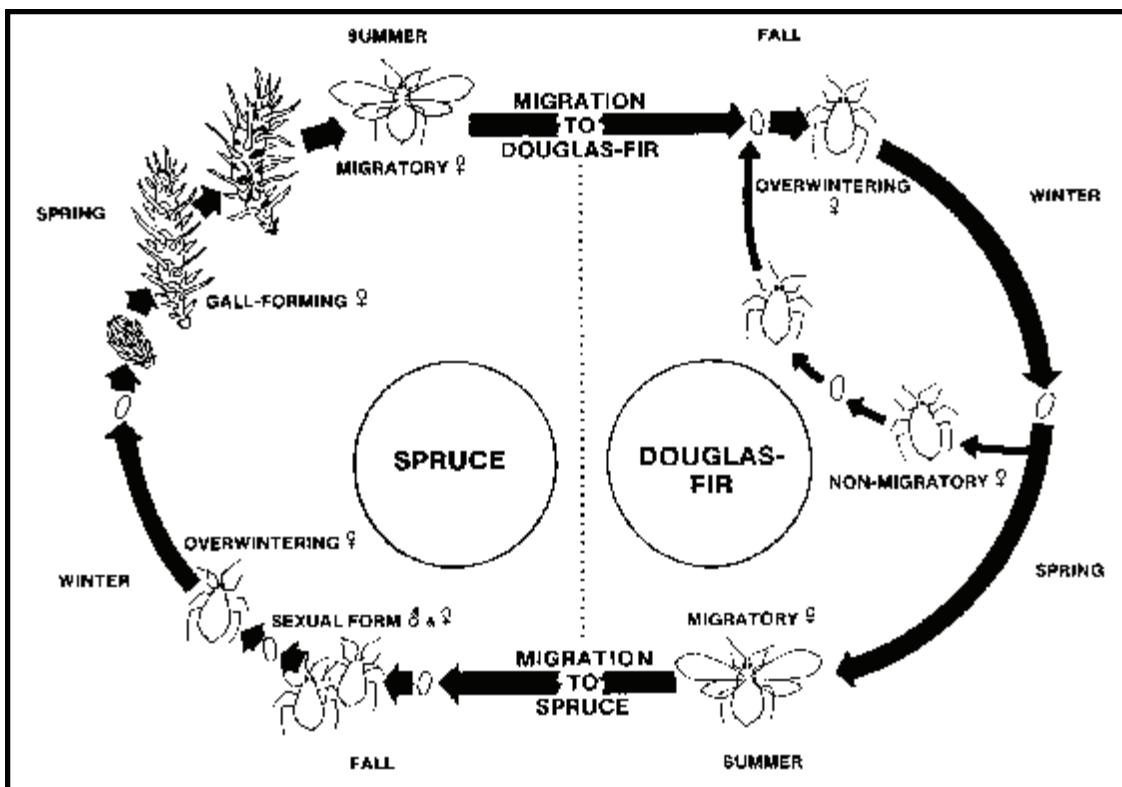
### CYCLE ON DOUGLAS-FIR:

Migrating winged females from spruce lay eggs on needles producing several generations of woolly aphids.



Pini rot is often indicated by swollen knots on the stem which have a brown, punky interior. Photo by Whitney Shaw.

Figure 1. Life cycle of the Cooley spruce gall adelgid. Research indicates that the adelgids leaving spruce must develop on Douglas-fir before returning to spruce. Observations in Colorado suggest that spruce to spruce movement also may occur (Cranshaw, 2005)



## *Life History*

These woolly tufts can be found on current and last years needles (Figure 4). On the lower surfaces of Douglas-fir needles look for white woolly tufts each containing a single adelgid. Late in the summer, some of the woolly aphids produce wings

and migrate back to spruce to deposit eggs that overwinter. Other aphids are wingless and remain on the Douglas-fir producing other overwintering forms.

All foliar applications should be directed at the underside of spruce terminals where the overwintering aphids are concentrated.

## **Management**

Administering treatments to control Cooley spruce gall populations are generally not necessary. The adelgid populations are highly cyclical, with population densities varying from one season to the next. However, to prevent aesthetic injuries that can detract from tree appearance there are registered insecticide treatments to control populations.

**Control efforts must be initiated before the galls begin to form.**

- Treatments can be applied in the fall, after the overwintering females have settled on plants or in the spring.
- Spring applications are most effective if applied before the insects have begun to swell with eggs which typically occurs in late April.

**Foliar treatments**

- Foliar treatments of carbaryl (Sevin) and permethrin have been most effective in Colorado State University trials.
- Although horticultural oils are also effective, they can cause temporary discoloration of spruce needles.
- Insecticidal soaps are only somewhat effective if applied to spruce, but are used widely to control populations of this insect on Douglas-fir. All foliar applications should be directed at the underside of spruce terminals where the overwintering aphids are concentrated.

On small spruce trees, prune current galls before adults emerge in late July. Removing old galls will not affect infestations because the insects have left the tree when the galls turn brown. Old (brown) galls are not used by any later stages of this insect. When establishing plantings, avoid placing Douglas-fir and spruce trees close together. Chemical control is not warranted in forest stands.

## *Other Reading*

Cranshaw, W. S. 2005. Cooley spruce galls. Colorado State University Cooperative Extension. Ft. Collins, CO. Pest Fact Sheet, No. 5.534. 3 p.

Cranshaw, W.S., D. Leatherman, B. Kondratieff. 1994. Insects that feed on Colorado trees and shrubs. Colorado State University, Ft. Collins, CO. Bulletin 506A. 176 p.

Overhulser, D. 2005. Cooley spruce gall adelgid. Oregon Dept. of Forestry, Salem, OR. Forest Health Note. 2 p.

### **Forest Health Protection and State Forestry Organizations**

#### **Assistance on State And Private Lands**

Montana: (406) 542-4300

Idaho: (208) 769-1525

Utah: (801) 538-5211

Nevada: (775) 684-2513

Wyoming: (307) 777-5659

N.Dakota: (791)228-5422

#### **Assistance on Federal Lands**

US Forest Service Region One

Missoula: (406) 329-3605

Coeur d'Alene: (208) 765-7342

US Forest Service Region Four

Ogden: (801) 476-9720

Boise: (208) 373-4227

